Patent claims

1. A method for loading and unloading rail cars, wherein at least one car, having a car frame (40) and a car superstructure (1), is moved into a loading and unloading position, and:

a) when unloading takes place, the car superstructure (1) is lifted off from the car frame by means of lifting devices (101, 111) to an unloading level, and after the lifting operation the car superstructure (1) is moved at the unloading level in a transverse direction with respect to a longitudinal plane (7) of the car until the car superstructure (1) is seated completely on a loading and unloading face (140), and

b) when loading takes place, the car superstructure (1) is moved from the loading and unloading face (140) in a transverse direction with respect to the longitudinal plane (7) of the car to above the car frame (40) and the car superstructure (1) is lowered, by means of the lifting devices (101, 111), onto the car frame (40) which is located in the loading and unloading position,

characterized in that the lifting and the lowering of the car superstructures (1) is carried out by means of lifting devices (101, 111) which are anchored to the track bed or secured to a platform.

2. The method as claimed in claim 1, characterized in that the car (1, 40) is roughly pre-positioned for the loading and unloading operations by means of a train lock, and finely positioned in the loading and unloading position by means of a positioning device (121).

3. The method as claimed in claim 1 and/or 2, characterized in that a horizontal leveling of the car (1, 40) in the longitudinal and transverse directions is carried out before the car superstructure (1) is

lifted.

4. The method as claimed in one or more of the preceding claims, characterized in that the horizontal leveling is carried out by means of the positioning device (120) which acts on the car frame (40).

5. The method as claimed in one or more of the preceding claims, characterized in that the car superstructure (1) is lifted to platform level (140).

6. The method as claimed in one or more of the preceding claims, characterized in that the car frame (40) is secured in the direction of travel during the loading and unloading operations.

7. The method as claimed in one or more of the preceding claims, characterized in that the car superstructure is loaded and unloaded on the platform (140) irrespective of the presence of a car frame (40).

8. The method as claimed in one or more of the preceding claims, characterized in that the car superstructure is guided in a way which is secured against tilting throughout the loading and unloading operations.

9. The method as claimed in one or more of the preceding claims, characterized in that the horizontal leveling of the cars (1, 40) is carried out directly before the actual operation of lifting the car superstructure (1), wherein the leveling is carried out in a first phase and the lifting in a second phase of a uniform movement of the lifting device (111).

10. The method as claimed in one or more of the preceding claims, characterized in that the car frames are automatically released again in the direction of travel after the loading and unloading operations have

ended.

11. The method as claimed in one of the preceding claims, wherein the first car is moved into the unloading position and a second car is moved into the loading position, characterized by the steps of:

- lateral pushing of the car superstructure (1) off the car frame of the first car, and
- lateral pushing of the car superstructure onto the car frame of the second car.

12. The method as claimed in claim 11, characterized by the step of:

- arranging the second car frame next to the first car frame in such a way that the car superstructure is pushed onto the second car frame, while the car superstructure is pushed off from the first car frame.

13. A method for transferring cargo from a first train to a second train at an unloading and loading position with lifting devices (101, 111; 201, 221) which are anchored to the track bed or to secured to a platform, having the steps of:

- moving the first train with at least a first car (1, 40), which comprises a car frame (40) and a car superstructure (1) with the cargo, into the unloading position,
- lifting the car superstructure (1) off the car frame (40) by means of the lifting devices (101, 111; 201, 221),
- moving the car superstructure (1) in a direction transverse with respect to a car longitudinal plane (7) of the first car until the car superstructure (1) is essentially not arranged above the first car frame (40),
- moving the second car with at least a second car which comprises a car frame (40) into the loading position,

- moving the car superstructure (1) in a direction transverse with respect to a longitudinal car plane (7) of the second car until the car superstructure (1) is arranged above the car frame (40) of the second car,
- lowering the car superstructure (1) onto the second car frame (40) by means of the lifting devices (101, 111; 201, 221).

14. The method as claimed in claim 13, characterized in that the first and second trains are arranged one next to the other at the unloading and loading positions, while the car superstructure (1) is transferred from the car frame (40) of the first train to the car frame of the second train.

15. The method as claimed in claim 13, characterized in that the first train is arranged next to the unloading and loading position to which the car superstructure (1) is moved from the car frame (40) of the first train, and in that the second train is arranged next to the unloading and loading position from which the car superstructure (1) is moved to the car frame of the second train, in particular simultaneously or at a later time.

16. The method as claimed in claim 15, characterized in that, after the first train has been unloaded, the second train is moved to the position of the first train next to the unloading and loading position, and the car superstructure (1) is moved onto the adjacent car frame (40) of the second train.

17. A loading and/or unloading device for car superstructures (1) of a rail car (1, 40) with a loading/unloading face (140) which is arranged adjacent to rail tracks (43), having lifting devices (101, 111) for lifting a car superstructure (1) from a car frame (40) and lowering said car superstructure (1) onto it,

and means for moving the car superstructure (1) transverse with respect to the direction of travel of the car (1, 40), in a position which is raised with respect to the car frame (40), with the result that the car superstructure (1) can be moved onto the loading and unloading face (140) from a position vertically above the car frame (40), wherein one end of the lifting devices (101, 111) acts on the car superstructure (1), in particular in order to carry out the method as claimed in one of claims 1 to 16, characterized in that at the other end the lifting devices (101, 111) are supported directly or indirectly and independently of the car frame, in particular on the ground area, adjacent to the tracks (43).

18. The loading and/or unloading device as claimed in claim 17, characterized in that the loading and unloading device has a position device for positioning the car (1, 40) in its direction of travel.

19. The loading and unloading device as claimed in claim 17 or 18, characterized in that the loading and unloading device has means for leveling, in particular for horizontally and/or vertically leveling, the car (1, 40) and/or the car superstructure (1) and/or the car frame (40) so that the car frame (40) and/or the car superstructure (1) and/or the entire car (1, 40) can be leveled in all direction, in particular in the horizontal and/or vertical directions longitudinally and transversely with respect to the direction of travel of the car (1, 40).

20. The loading and/or unloading device as claimed in one or more of claims 17 to 19, characterized in that the loading and/or unloading device (100) has a multiplicity of lifting devices (101) which are arranged along the tracks (43), on the outside next to the track rails.

21. The loading and/or unloading device as claimed in one or more of claims 17 to 20, characterized in that the lifting devices (101) are pneumatic or hydraulic or mechanical lifting devices, in particular lifting devices based on the wedge principle.

22. The loading and/or unloading device as claimed in one or more of claims 17 to 21, characterized in that the lifting devices (101, 111) have a load support (102), wherein the load support (102) interacts with an underside of the car superstructure (1) in such a way that the car superstructure (1) can be lifted with its underside at the level of the loading and/or unloading face (140).

23. The loading and/or unloading device as claimed in one or more of claims 17 to 22, characterized in the load supports (102) of the lifting devices (101, 111) have roller elements (103), for example rollers or ball elements, so that, after the lifting operation, the car superstructure (1) can be pushed in a direction transverse with respect to the direction of travel on the load supports (102).

24. The loading and/or unloading device as claimed in one or more of claims 17 to 23, characterized in that the loading and/or unloading face is a platform (140) which forms a plane with the load supports (102) in their raised position.

25. The loading and/or unloading device as claimed in one or more of claims 17 to 24, characterized in that the lifting devices (102) are arranged secured to the track bed next to the cars (1, 40) in their loading and unloading position.

26. The loading and/or unloading device as claimed in one or more of claims 17 to 25, characterized in that the lifting device (101) is embodied as a walking beam

which extends outside the rail tracks (43) adjacent to the actual rails and rests adjacent to the track bed on a roadway (110) which is secured to the ground, or is supported directly or indirectly on this roadway (110).

27. The loading and/or unloading device as claimed in one or more of claims 17 to 26, characterized in that the walking beam (111) is embodied with an essentially rectangular shape in cross section, with an upper side (112), an underside (113) and a first free end (114) and a second free end (115), wherein supporting rollers (116) are arranged in the region of the underside (113), preferably in the region of the free ends, so that the walking beam (111) can easily be displaced on the rolling surface (110) in its longitudinal direction which is directed parallel to the direction of the track.

28. The loading and/or unloading device as claimed in one or more of claims 17 to 27, characterized in that the free ends (114, 115) are embodied at an acute angle with respect to the rolling surface (110) so that ramp faces (117) which point to the roadway (110) are formed.

29. The loading and/or unloading device as claimed in one or more of claims 17 to 28, characterized in that supporting rollers (116) are arranged in the region of the ramp faces (117).

30. The loading and/or unloading device as claimed in one or more of claims 17 to 29, characterized in that, during the loading and/or unloading operations, the walking beam (111) is arranged underneath the car superstructure (1), in an approximately central position with respect to the longitudinal extent of the car superstructure (1).

31. The loading and/or unloading device as claimed in

one or more of claims 17 to 30, characterized in that a positioning device (120) is present for positioning the car superstructure (1) together with the car frame (40) with respect to the walking beam (111).

32. The loading and/or unloading device as claimed in one or more of claims 17 to 31, characterized in that roller elements (103) which correspond to the roller elements (103) on the platform (140) are arranged on the upper side (112) of the walking beam (111).

33. The loading and/or unloading device as claimed in one or more of claims 17 to 32, characterized in that the positioning device (120) has a positioning/lifting carriage (121), spaced apart from the free ends (114, 115) in the longitudinal direction and aligned with the walking beam (111), which positioning/lifting carriage (121) is capable of being displaced in a driven fashion or supporting rollers (116) on the rolling surface (110) parallel to the direction of travel of the car (1, 40).

34. The loading and/or unloading device as claimed in one or more of claims 17 to 33, characterized in that the positioning/lifting carriage (121) is coupled to a linear drive (122), wherein the linear drive (122) is connected at one end to the positioning/lifting carriage (121) and is attached at the other end to a stay (123) which is secured to the ground.

35. The loading and/or unloading device as claimed in one or more of claims 17 to 34, characterized in that the linear drive is of pneumatic, hydraulic, mechanical, electrical or electromagnetic design.

36. The loading and/or unloading device as claimed in one or more of claims 17 to 35, characterized in that the positioning/lifting carriage (121) has a first free end (124) which faces one of the free ends (114, 115)

of the walking beam (111) and has an opposing ramp face (125) which corresponds to the ramp face (117).

37. The loading and/or unloading device as claimed in one or more of claims 17 to 36, characterized in that the positioning/lifting carriage (121) has an upper side (126) which in the position of rest extends approximately in alignment with the upper side (112) of the walking beam, and in terms of level is arranged underneath the car superstructure (1).

38. The loading and/or unloading device as claimed in one or more of claims 17 to 37, characterized in that a catch hook element (128) which is arranged so as to be pivotable about an axle (127) and has a hook base (129) and a hook projection (130) is arranged in the region of the upper side (126) adjacent to the free end (124), wherein the hook base is of longitudinally extended, web-shaped design and extends from the axle (127) approximately over one third of the positioning/lifting carriage (121) from the first free end (124) away in the direction of a second free end (131) of the positioning/lifting carriage (121), wherein the hook projection (130) extends from the hook base (129) at the end for a certain distance in an approximately vertically upward direction.

39. The loading and/or unloading device as claimed in one or more of claims 17 to 38, characterized in that in the position of rest the catch hook element (128) is arranged in such a way that the hook projection (130) is arranged at or somewhat below the level of the upper side (126) of the positioning/lifting carriage (121).

40. The loading and/or unloading device as claimed in one or more of claims 17 to 39, characterized in that a guide roller (132), which interacts with a run-up bracket (133) which is secured to the ground and has a ramp face (135), is arranged on the hook base (129)

opposite the hook projection (130).

41. The loading and/or unloading device as claimed in one or more of claims 17 to 40, characterized in that the ramp face (134) of the run-up bracket (133) of the guide roller (132) of the catch hook element (128) is assigned in such a way that in a position of rest the hook projection (130) comes to rest approximately at the level of the upper side (126) of the positioning/lifting carriage (121).

42. The loading and/or unloading device as claimed in one or more of claims 17 to 41, characterized in that, corresponding to the hook element (128), in particular its upper edge (135) of the hook base (129), the car frame (40) has a corresponding supporting roller (136) which is arranged in such a way that it can interact with the upper edge (135) of the hook base.

43. The loading and/or unloading device as claimed in one or more of claims 17 to 42, characterized in that the catch hook element (128) together with the axle (127) can be moved relative to the positioning/lifting carriage (121) in the longitudinal direction of said positioning/lifting carriage (121) and is damped by means of a spring and/or damping device (137), in particular can be moved to the end (131) of the positioning/lifting carriage (121) with damped prestress with respect to the positioning/lifting carriage (121).

44. The loading and/or unloading device as claimed in one or more of claims 17 to 43, characterized in that the lifting devices (101, 111) are lever arrangements or scissor arrangements.

45. The loading and/or unloading device as claimed in one or more of claims 17 to 44, characterized in that at least a selection of the roller elements (103) of

the lifting devices (101, 111) can be driven by motor.

46. The loading and/or unloading device as claimed in one or more of claims 17 to 45, characterized in that the roller elements (103) can be driven electrically, electromagnetically, hydraulically or pneumatically.

47. The loading and/or unloading device as claimed in one or more of claims 17 to 46, characterized in that the roller elements (103) can be driven directly or by actuation by the platform.

48. The loading and/or unloading device as claimed in one or more of claims 17 to 47, characterized in that the drive energy for all the drives of the loading and/or unloading device (100) is generated centrally.

49. The loading and/or unloading device as claimed in one or more of claims 17 to 48, characterized in that there are devices for securing the car (1, 40) in the longitudinal direction of the car (1, 40) during the loading and/or unloading operations.

50. The loading and/or unloading device, in particular as claimed in one of claims 17 to 49, for car superstructures (1) of a rail car (1, 40) having a loading/unloading face which is arranged adjacent to rail tracks (43), having lifting devices (201) for lifting a car superstructure (1) from a car frame (40) of a car (1, 40) and lowering said car superstructure (1) onto it, and means for moving the car superstructure (1) transverse with respect to the direction of travel of the car (1, 40), in a raised position with respect to the car frame (40), so that the car superstructure (1) can be moved from a position vertically above the car frame (40) onto the loading and unloading face, wherein the lifting devices (201) act at one end on the car superstructure (1), in particular in order to carry out the method as claimed

in one of claims 1 to 16, characterized in that the lifting devices (201) have walking beams (221) which can be displaced transversely with respect to the direction of the rails, wherein the lifting devices (201) are preferably arranged on the platform.

51. The loading and/or unloading device as claimed in claim 50, characterized in that the lifting devices (201) have supply terminals for supplying energy and/or signal terminals for transmitting signals, engage if appropriate in the car (1, 40) and/or can be connected to the car (1, 40) by means of corresponding terminals of the car (1, 40).

52. The loading and/or unloading device as claimed in claim 51, characterized in that the lifting devices (201) are configured in such a way that if the first and the second train sections are arranged one next to the other, walking beams of adjacently arranged lifting devices can be extended, if appropriate beyond an intermediate track, and the extended walking beams (221) engage one in the other in order to form a bridge, wherein the car superstructure (1) can be transferred from the car frame (40) of a first train to an associated car frame of a second train by means of the bridge.

53. The loading and/or unloading device as claimed in claim 52, characterized in that the horizontal walking beams (221) of the lifting devices (201) are configured for a horizontal movement during which the lifting devices (201), in particular the walking beams (221), interact with ramp faces (217) and/or corresponding faces of the car and/or corresponding faces of the car superstructure in order to bring about an essentially small amount of travel of the car superstructure (1), wherein the amount of travel is sufficient to overcome differences in height dependent on the car frame and/or bogie.

54. The loading and/or unloading device as claimed in claim 52 or 53, characterized in that the walking beams (221) are arranged horizontally and transversely with respect to the longitudinal direction of the rails.

55. The loading and/or unloading device as claimed in one of claims 52 to 54, characterized in that the walking beams (221) can be extended into a position of rest in which the walking beams (221) are arranged outside a predefined track region (243), in particular outside valid profile limits for goods traffic by rail, and are configured to be extended, for example on supporting rollers in roadways which are secured to the platform, until ramp faces (225) which are formed on the end face of the walking beams (221) engage in associated corresponding faces (217) of the cars (1, 40), in particular of the car longitudinal members, wherein the car longitudinal member is preferably centered and/or secured horizontally, vertically and/or in the longitudinal direction.

56. The loading and/or unloading device as claimed in one of claims 52 to 55, characterized in that the walking beams (221) can be engaged with the car frame (40) in such a way that an upper edge of the walking beam (221) is arranged in a preferably horizontal plane with an upper edge of the car longitudinal member of the car frame (40), wherein a loading and unloading face is formed which is arranged essentially horizontally, preferably at maximum at the level of the same plane.

57. The loading and/or unloading device as claimed in one of claims 52 to 56, characterized by a device for forming a supporting film, in particular a fluid supporting film and/or a magnetic supporting film, on a supporting surface for the car superstructure (1), wherein the supporting surface is formed on the loading

and/or unloading device and on the car superstructure (1).

58. The loading and/or unloading device as claimed in one of claims 52 to 57, characterized by a device for heating and/or cleaning elements of the loading and/or unloading device, the surface of which forms the supporting surface for the car superstructure (1), in particular for heating and/or cleaning the supporting surface which is formed on the walking beams (221).

59. A car frame for receiving a car superstructure (1) having two bogies (41, 42) which are arranged spaced apart from one another in the direction of travel of the car frame (40) and are connected by means of a member structure, characterized in that the member structure is a central longitudinal member (44, 244).

60. A car frame as claimed in claim 59, characterized in that the longitudinal member (44, 244) has a rectangular spatial form in cross section, preferably the form of a hollow tube, and if appropriate suitable reinforcement plates and/or reinforcement webs on the inside.

61. The car frame as claimed in claim 59 or 60, characterized by prestressing means for generating a prestress in the longitudinal direction on the car frame in such a way that flexural rigidity of the car frame is increased.

62. The car frame as claimed in one of claims 59 to 61, characterized in that the longitudinal member (44) is embodied so as to be less wide than the gauge of the wheel sets of the bogies (41, 42).

63. The car frame as claimed in one or more of claims 59 to 62, characterized in that the longitudinal member (44, 244) is arranged offset parallel between

the bogies (41, 42) and bent downward at a right angle in such a way that its upper side (45) is arranged somewhat above the rotational axes of the wheel sets, in the vertical direction in the region of said rotational axes of the wheel sets.

64. The car frame as claimed in one or more of claims 59 to 63, characterized in that the longitudinal member (44, 244) is embodied so as to be bent at a right angle at both ends and is seated on the bogies (41, 42) with its free ends (46) thereabove.

65. The car frame as claimed in one or more of claims 59 to 64, characterized in that the longitudinal member (44) is of such a width that a car superstructure (1) can be plugged onto the longitudinal member (44).

66. The car frame as claimed in one or more of claims 59 to 65, characterized in that the longitudinal member (44) interacts with a gap (10a) in a car superstructure (1) in such a way that the car superstructure (1) is secured in the vertical direction and in a transverse direction with respect to the longitudinal member (44).

67. The car frame as claimed in one or more of claims 59 to 66, characterized in that there are means with which a car superstructure (1) can be secured with respect to the longitudinal member (44, 244), in the longitudinal direction thereof.

68. The car frame as claimed in claim 66 or 67, characterized in that the means for securing and/or locking the car superstructure (1) with respect to the longitudinal member (44, 244) are arranged on the car frame in such a way that the car superstructure (1) essentially transmits no bending load to the longitudinal member (44, 244).

69. The car frame as claimed in one of claims 59 to 68, characterized in that the car frame (40), in particular the longitudinal member (44, 244) of the car frame (40), has such a low level of rigidity that the rigidity of the car frame (40) is insufficient to receive static and/or dynamic loads, in particular the weight load, of the car superstructure (1), in particular of the car superstructure (1) which is loaded with cargo (30), per se or solely for the sake of safe operation, in particular does not satisfy the loading capacity provided for maximum loading of the car (1, 40).

70. The car frame as claimed in one or more of claims 59 to 69, characterized in that two longitudinal members are connected to one another by means of a single double-axle bogie in such a way that in each case two cars are supported on the double-axle bogie.

71. A car superstructure for a car frame (40), in particular as claimed in one or more of claims 59 to 70, wherein the car superstructure has an essentially trough-shaped spatial form, characterized in that the car superstructure (1) has a gap (10a) along its longitudinal extent at the bottom of the trough, which gap (10a) is arranged in the center in the bottom of the trough in the transverse direction of the car superstructure (1).

72. The car superstructure as claimed in claim 71, characterized in that the car superstructure (1) is formed from a first trough element (2) and a second trough element (3), wherein the trough elements (2, 3) have a spatial form which is approximately L-shaped in cross section and have a first trough element limb (4) and a second trough element limb (5).

73. The car superstructure as claimed in claim 71

and/or 72, characterized in that the trough element limbs (4, 5) are connected in their corner region by means of a sloping wall (6).

74. The car superstructure as claimed in one or more of claims 71 to 73, characterized in that the second trough element limb (5) forms part of the bottom of the car superstructure (1), and the trough element limb (4) forms a lateral boundary wall of the car superstructure (1).

75. The car superstructure as claimed in one or more of claims 71 to 74, characterized in that each trough element (2, 3) has an L-shaped, first free front end edge (8) and an L-shaped, second free front end edge (9) as well as a free longitudinal edge (10) pointing to a longitudinal center plane (7), and has an upper free longitudinal edge (11).

76. The car superstructure as claimed in one or more of claims 71 to 75, characterized in that the trough elements (2, 3) are arranged in such a way that the free longitudinal edges (10) lie one opposite the other in parallel and spaced apart so that a gap (10a) is formed which corresponds to a longitudinal member (44) of a car frame (40).

77. The car superstructure as claimed in one or more of claims 71 to 76, characterized in that the second trough element limbs (5) are arranged lying in a plane, and the free front end edges (8, 9) of the trough elements (2, 3) end flush with one another.

78. The car superstructure as claimed in one or more of claims 71 to 77, characterized in that a closing flap (13) which can pivot horizontally about an axle (12) is arranged at the free ends of the second trough element limbs (5), in each case at the ends of the two trough elements (2, 3), which closing flap can pivot

from a horizontal position, in which it ends flush with the trough limbs (5), into a vertical position in which the flap (13) bears against the free front end edges (9) of the first trough element limbs (4).

79. The car superstructure as claimed in one or more of claims 71 to 78, characterized in that, in the closed, folded-up position, the flap (13) ends flush, or somewhat below the level of the second longitudinal edges, with the trough elements (2, 3).

80. The car superstructure as claimed in one or more of claims 71 to 79, characterized in that the closing flap (13) has a first flat side (14) and a second flat side (15), wherein there are two narrow side boundary edges (16), one end edge (17) and one coupling edge (18).

81. The car superstructure as claimed in one or more of claims 71 to 80, characterized in that, in the region of the coupling edge (18), the flap (13) is connected to the trough elements (2, 3) so as to be pivotable in an articulated fashion about the axle (12), over a length which corresponds to the width of the second trough element limb (5).

82. The car superstructure as claimed in one or more of claims 71 to 81, characterized in that each case two trough elements (2, 3), whose horizontal trough element limbs (5) lie opposite one another in a spaced-apart arrangement, form a main part of the car superstructure (1) in a symmetrical fashion with respect to the longitudinal center plane (7).

83. The car superstructure as claimed in one or more of claims 71 to 82, characterized in that, in the region of the gap (10a), the flap (13) has a U-shaped recess which is open to the coupling edge (18) and which has two U limb edges (19) and one bottom boundary

edge (20).

84. The car superstructure as claimed in one or more of claims 71 to 83, characterized in that the U-shaped recess is dimensioned in such a way that, in the horizontally folded-out state of the flap (13), it constitutes a prolongation of the gap (10a), and in the vertically folded-up position of the flap (13) it forms a vertical stop for a central longitudinal member (44) of a car frame (40).

85. The car superstructure as claimed in one or more of claims 71 to 84, characterized in that, in the folded-up state, the flap (13) can be connected to the trough elements (2, 3) by means of suitable locking elements.

86. The car superstructure as claimed in one or more of claims 71 to 85, characterized in that, in the region of the end edge (17) of the flap (13), run-up ramp elements (21) are connected to the flap (13) so as to be articulated about an axle (22).

87. The car superstructure as claimed in one or more of claims 71 to 86, characterized in that, in the folded-up position of the flap (13), the run-up ramp elements (21) rest on an underlying surface, flush with the second flat side (15).

88. The car superstructure as claimed in one or more of claims 71 to 87, characterized in that the run-up ramp elements (21) have a wedge shape so that vehicles, for example a truck or a semitrailer truck can drive into the car superstructure (1).

89. The car superstructure as claimed in one or more of claims 71 to 88, characterized in that, in the folded-up state of the flap (13) of the run-up ramp elements (21) are folded up against the second flat

side (15) of the flaps (13) and secured there.

90. The car superstructure as claimed in one or more of claims 71 to 89, characterized in that support means (25) which can fold out are arranged along the longitudinal outer side of the car superstructure (1).

91. The car superstructure as claimed in one or more of claims 71 to 90, characterized in that the supporting means (25) are arranged along the longitudinal extent of the car superstructure (1) on both sides in such a way that both commercially available 20-foot containers (31) and 40-foot containers (32) can be fitted onto the folded-out supporting means (25).

92. The car superstructure as claimed in one or more of claims 71 to 91, characterized in that in a position of rest the supporting means (25) are arranged countersunk in the first trough element limbs (4) of the trough elements (2, 3), and when necessary can be folded inward in the direction of the longitudinal center plane (7) by pulling up so that supporting faces for the containers (31, 32) are produced.

93. The car superstructure as claimed in one or more of claims 71 to 92, characterized in that in the position of rest of the supporting means (25), said supporting means (25) do not project into the clearance between the trough elements (2, 3).

94. The car superstructure as claimed in one or more of claims 71 to 93, characterized in that gripping edges (26) are arranged at suitable spacings on the free second longitudinal edges (11) of the trough element limbs (4) and are embodied so as to correspond to gripping arms of what are referred to as piggyback cranes or similar loading cranes.

95. The car superstructure as claimed in one or more of claims 71 to 94, characterized in that the gripping edges (26) have a spatial form which is L-shaped in cross section and are arranged on the car superstructure (1) in such a way that a gripping undercut for the piggyback arms is formed.

96. The car superstructure as claimed in one or more of claims 71 to 95, characterized in that the car superstructure (1) can be locked on a longitudinal member (44) of a car frame (40) in the vertical direction and in a transverse direction with respect to the direction of travel by means of the gap (10a) and the bottom boundary edges (20).

97. The car superstructure as claimed in one or more of claims 71 to 96, characterized in that the car superstructure (1) can be secured in a self-locking fashion.

98. The car superstructure as claimed in one or more of claims 71 to 97, characterized in that a car is formed from a car superstructure (1) and a car frame (40), wherein floorboards (50) can be laid in the interior of the trough-shaped car superstructure (1) and the floorboards (50) have an upper side (51) which ends flush with the longitudinal edges (11).

99. The car superstructure as claimed in one or more of claims 71 to 98, characterized in that the floorboards (50) have an essentially rectangular-panel-shaped spatial form with longitudinal edges (52) and narrow side edges (53), wherein the floorboards (50) are arranged in such a way that the narrow side edges (53) bear against the first trough element limbs (4) so that joints between the floorboards (50) are oriented transversely with respect to the direction of travel.

100. The car superstructure as claimed in one or more

of claims 71 to 99, characterized in that the car superstructure (1) has vertically upwardly protruding stanchions (55) along the longitudinal edges (11) of the trough element limbs (4) so that a car with stanchions can easily be formed from a flat car.

101. The car superstructure as claimed in one or more of claims 71 to 100, characterized in that the floorboards (50) are arranged in a somewhat lowered position compared to the level of the longitudinal edges (11) so as to form an intermediate floor.

102. The car superstructure as claimed in one or more of claims 71 to 101, characterized in that the car (1, 40) is embodied as a motor vehicle transporter car.

103. The car superstructure as claimed in one or more of claims 71 to 102, characterized in that a supporting floor structure can be inserted into the interior of the trough-shaped car superstructure (1).

104. The car superstructure as claimed in one or more of claims 71 to 103, characterized in that the supporting floor structure has rollers and/or balls for rolling, for example, air cargo pallets or containers into the car superstructure (1).

105. The car superstructure as claimed in one or more of claims 71 to 104, characterized in that the car superstructure (1) has vertically upwardly protruding plate elements along the longitudinal edges (11) of the trough element limbs (4) and at the ends on the trough element limbs (5) so that a bulk freight car can easily be formed from a flat car.

106. The car superstructure as claimed in one of claims 71 to 105, characterized in that the car superstructure (1) is designed and/or configured to sit in a flat arrangement on the longitudinal member (244).

107. The car superstructure as claimed in one of claims 71 to 106, characterized in that the car superstructure (1) is of essentially one-part design.

108. The car superstructure, in particular as claimed in one of claims 71 to 107, characterized in that the trough shape of the car superstructure (1) is closed in cross section, wherein the car superstructure (1) has internal dimensions suitable for trucks to pass through and preferably has external dimensions within the valid profile limits, in particular for rail transport in the European Union, Spain and/or Eastern Europe.

109. The car superstructure as claimed in one of claims 72 to 108, characterized in that the trough limb elements (4, 5) of the car superstructure (1) are of load-bearing, preferably hollow, design in order to receive car loads.

110. The car superstructure as claimed in one of claims 78 to 109, characterized in that one or both closing flaps (13) form, together with a preferably foldable mechanism, a joint frame which has receptacles for securing cargo (30), in particular receptacles on an upper side for cargo positioning means, and/or which can be locked to the car superstructure (1).

111. The car superstructure as claimed in claim 110, characterized in that the joint frames are configured to stabilize the trough limb elements (4, 5).

112. The car superstructure as claimed in one of claims 90 to 111, characterized in that the supporting means (25) are configured to receive and/or to secure, in a frictionally locking and/or positively locking fashion, containers which rest on a truck semitrailer or truck power unit with a trailer, which has been driven into the car superstructure (1).

113. The car superstructure as claimed in one of claims 90 to 112, characterized in that the supporting means (25) are configured to receive and/or to secure, in a frictionally locking and/or positively locking fashion, interchangeable bridges on a truck loading area of a truck with or without trailer which has been driven into the car superstructure.

114. The car superstructure as claimed in claim 113, characterized in that the supporting means (25) are configured to lift the container from the truck/trailer loading area and lower it onto it.

115. The car superstructure as claimed in one of claims 71 to 114, characterized by at least one connecting device for connecting power supply means and/or signal transmission means to the car superstructure (1).

116. The car superstructure as claimed in claim 115, characterized in that the car superstructure (1) which is locked to the car frame (40) forms one unit which cannot be unlocked as long as the power supply means and/or signal transmission means are not connected to the connecting devices of the car superstructure (1).

117. The car superstructure as claimed in claim 116, characterized in that the car frame and/or car superstructure have an emergency unlocking device which is provided for unlocking the passively locked unit comprising the car superstructure and car frame.

118. The car superstructure as claimed in one of claims 71 to 117, characterized in that the car superstructure (1) is configured to slide on a layer of fluid.

119. The car superstructure as claimed in claim 118,

characterized by a lubricant device which is provided for producing a film of lubricant underneath the contact area of the car superstructure (1), on which film of lubricant the car superstructure (1) can be displaced transversely, in particular in order to load and/or unload the car frame (40).

120. A car (1, 40) essentially composed of a car superstructure (1), in particular as claimed in one of claims 71 to 119, and a car frame (40), in particular as claimed in one of claims 59 to 70, having at least one longitudinal member (44, 244), characterized in that

a) the car frame (40), in particular the longitudinal member (44, 244) of the car frame (40), has an insufficient loading capacity, in particular insufficient rigidity, for the predefined loading capacity of the car (1, 40),

b) the car frame (40) is locked to the car superstructure (1) using suitable unlockable locking elements,

c) the predefined loading capacity, in particular sufficient rigidity, of the car (1, 40) is achieved by means of the locking.